

POLOS[®] FR-SCANNER

FR-Scanner is a compact bench-top tool for the automatic characterization of films and coatings on wafers, masks or other substrates. Automated, ultra-fast & accurate wafer mapping; FR-Scanner is the ideal tool for the fast and accurate mapping of film properties: thickness, refractive index, uniformity, color etc.

Wafers of any diameter (300 mm max.) / shape can be accommodated on the vacuum chuck.



FR-Scanner scans the wafers by rotating the wafer and by moving it linearly (Polar Coordinates) with unparalleled speed and accuracy in both radius and angle. This way, accurate reflectance data with high repeatability are recorded, making FR-Scanner the ideal tool for at-line and on-line characterization of coatings on wafers or other substrates at processing facilities.

It is offered in a wide range of configurations for the characterization of films as thin as few nanometers and as thick as several hundreds of microns and is accompanied with a dedicated S/W for daily routine use. The FR-Scanner provides excellent performance in terms of accuracy, precision, reproducibility and long-term stability.

APPLICATIONS

- Semiconductor Manufacturing (photoresists, dielectrics, poly-Si, a-Si, DLC, photonic multilayer structures)
- PV Industry
- University & Research labs
- Liquid Crystal Display
- Optical Coatings
- Polymers
- MEMS and MOEMS
- Substrates: transparent (glass, quartz, etc.) and semi-transparent

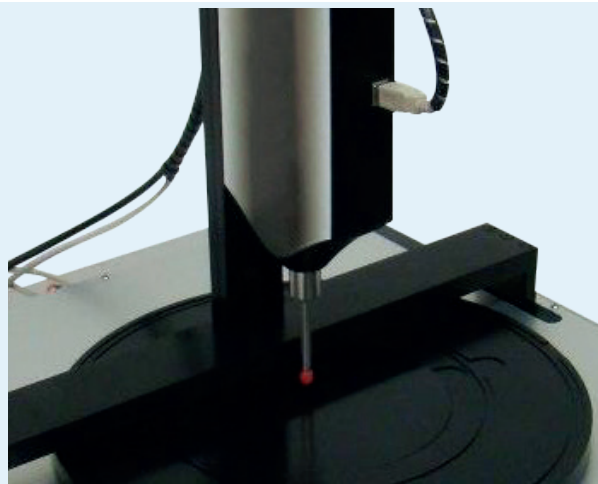
FEATURES

- Single-click analysis (no need for initial guess)
- Dynamic measurements
- Measurement of n & k , color is included
- Save videos for presentations
- 600+ non-identical materials
- Multiple installations for off-line analysis
- Free of-charge Software update

PRINCIPLE OF OPERATION

White Light Reflectance Spectroscopy (WLRS) measures the amount of light reflected from a film or a multilayer stack over a range of wavelengths, with the incident light normal (perpendicular) to the sample surface.

The measured reflectance spectrum, produced by interference from the interfaces is being used to determine the thickness, optical constants (n & k), etc. of free-standing and supported (on transparent or partially/fully reflective substrates) stack of films.



MODEL	UV/Vis	UV/ NIR- EXT	UV/ NIR- HR	D UV/ NIR	VIS/ NIR	NIR D Vis/ NIR	NIR	NIR- 980	NIR- 1310
Spectral Range (nm)	200 - 850	200 - 1020	200 - 1100	200 - 1700	370 - 1020	370 - 1700	900 - 1700	900 - 1050	1280 - 1350
Pixels	3648	3648	3648	3648 & 512	3648	3648 & 512	512	3648	512
Thickness range	3 nm - 80 um	3 nm - 90 um	3 nm - 120 um	1 nm - 250 um	15 nm - 100 um	15 nm - 250 um	50 nm - 250 um	300 nm - 1.2 mm	12 um - 2 mm
Min. Thickness for n & k ¹	50 nm	50 nm	50 nm	50 nm	100 nm	100 nm	500 nm	-	-
Thickness Accuracy ²	1 nm or 0.2 %	1 nm or 0.2 %	1 nm or 0.2 %	1 nm or 0.2 %	1 nm or 0.2 %	2 nm or 0.2 %	3 nm or 0.4 %	50 nm or 0.2 %	50 nm or 0.2 %
Thickness Precision ^{3,4}	0.02 nm	0.02 nm	0.02 nm	0.02 nm	0.02 nm	0.02 nm	0.1 nm	5 nm	5 nm
Thickness stability ⁵	0.05 nm	0.05 nm	0.05 nm	0.05 nm	0.05 nm	0.05 nm	0.15 nm	5 nm	5 nm
Light Source	Balanced Deuterium & Halogen				Halogen				SLED
Light Source MTBF	2,000 h				5,000 h				200,000 h
Material Database	> 600 different materials								
Sample Size	Wafers: 2"- 3"- 4"- 6"- 8" - 300 mm ¹								
Resolution in R/ Angle	5 μm/0.1°								
Scanning Speed ⁶	300 meas/min (8" wafer size)								
Dimensions (mm)	600 (w) x 750 (L) x 500 (h) mm and 450 (w) x 320 (L) x 250 (h) mm								
Power Requirements	110 V/230 V, 50-60 Hz, 300 W								

¹ Specifications are subject to change without any notice, ² Measurements compared with a calibrated spectroscopic ellipsometer and XRD, ³ Average of standard deviation of mean value over 15 days. Sample: 1micron SiO₂ on Si wafer, ⁴ Standard deviation of 100 thickness measurements. Sample: 1micron SiO₂ on Si wafer, ⁵ 2*Standard-Deviation of daily average over 15 days. Sample: 1micron SiO₂ on Si wafer. ⁶ The chuck can accommodate samples of arbitrary shape. Stage 450 mm wafers is also available on request. True X-Y scanning is also possible through custom-made configuration.